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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
JACKSON, JAKIEDA R	

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/616,310	ARONOWITZ, HAGAI	
	Examiner	Art Unit	
	JAKIEDA R. JACKSON	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,7,15,17,18,24,26,27,37,39,41-43,51 and 53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-4, 7, 15, 17-18, 24, 26-27, 37, 39, 41-43, 51 and 53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Pre-Brief Conference

1. In response to the Pre-Brief Conference mailed September 2, 2008, the office has reconsidered Applicant's arguments to the Final Rejection mailed 6/5/2008.

Response to Arguments

2. Applicant argues that the cited art in alone or in combination fails to teach the recited phoneme lattice construction, which includes determining K-best initial phoneme paths leading to a frame based on a first score of each potential phoneme path, and calculating a second score for each of the K-best phoneme paths. The art nowhere teaches or suggests determining these two score, the first of which is to determine K-best initial phoneme paths and the second of which is for each of these K-best paths. However, it is old and well known in the speech processing art to determine K-best phoneme paths. In order to determine the K-best phoneme paths, numerous values have to be computed. Therefore, Applicant's arguments are not persuasive.

Applicant further argues that all of Wolf teachings are directed to a word lattice. However throughout Wolfe's specification, in particular, paragraphs 0023 and 0055, Wolfe teaches phoneme lattices. In addition, Wolfe teaches word-level lattices (paragraphs 0020); therefore, Applicant's arguments are not persuasive.

Applicant further argues that Chaudhari does not teach computing of a score for a traversed path of phoneme lattice based on at least one of a phone confusion matrix and multiple language models. Applicant also argues that there is no modifying of the

decoding graphs such that at least one arc is extended so that two arcs that did not directly connect now directly connect, at a different second frame. Furthermore, Applicant's argue that Chaudhari fails to teach the generation of three scores or where a given score is combined with a technique to incorporate word-level language probabilities. Applicant's arguments are persuasive, but are moot in view of new grounds of rejection.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1, 3-4, 7, 15 and 17-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1, 3-4, 7, 15 and 17-18 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. The instant claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claim 1, 3-4, 7, 15, 17-18, 24, 26-27, 37, 39, 41-43, 51 and 53** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolf et al. (PGPUB 2003/0204399), hereinafter referenced as Wolf in view of Chou et al. (USPN 5,805,772), hereinafter referenced as Chou and in further view of Wegmann et al. (USPN 6,224,636), hereinafter referenced as Wegmann.

Regarding **claim 1**, Wolf discloses a method, system and article, hereinafter referenced as a method for processing a speech signal, comprising:

receiving an input speech signal (spoken queries; column 1, paragraph 0013);

constructing a phoneme lattice for the input speech signal (lattice; column 2, paragraphs 0020-23 with column 4, paragraph 0055);

searching the phoneme lattice to produce a likelihood score for each potential path (likelihood of paths; column 3, paragraph 0038);

determining a processing result for the input speech signal based on the likelihood score of each potential path (likelihood scores of path; column 3, paragraphs 0033-0040);

segmenting an input speech signal into frames (word-level lattices; column 2, paragraph 0020 with column 3, paragraphs 0033-0040);

extracting acoustic features for a frame of the input speech signal (acoustic information; column 2, paragraphs 0022-0023 with column 1, paragraph 0013);

determining K-best initial phoneme paths leading to the frame based on a first score of each potential phoneme path leading to the frame (best scoring path; column 3, paragraphs 0033-0040); and

calculating a second score for each of the K-best phoneme paths for the frame (confidence scores; column 2, paragraph 0021 with column 3, paragraphs 0033-0040), but does not specifically teach determining vertices and arc parameters of the phoneme lattice for the input speech signal and an extension of at least one of first and second arcs such that the two arcs are directly connected at a different frame.

Chou discloses a speech recognition method (speech recognition; column 1, lines 7-10) comprising determining arc parameters of the phoneme lattice for the input speech signal (arc; column 3, lines 6-13 and column 4, lines 9-25 with column 6, lines 19-40);

wherein searching the phoneme lattice comprises:

receiving a phoneme lattice (figures 3);

traversing the phoneme lattice via potential paths (traversing the paths; column 2, line 55 – column 3, line 11 and column 6, lines 1-25);

computing a score (score) for a traversed path based on at least one of a phoneme confusion matrix and a plurality of language models (one or more language models; column 3, lines 1-11); and

modifying the score for the traversed path by allowing repetition of phonemes allowing flexible endpoints for phonemes (various connections) in a path such that at least one of a first arc that ends at a first frame (head) and a second arc that starts at a third frame (tail) is extended so that the first arc and the second arc are directly connect at a second frame (column 14, lines 1-19 and column 5, lines 9-22), reducing search complexity.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wolf's method wherein it is described above, for a high resolution decoding scheme when classifying acoustically confusable speech events (column 5, lines 56-59), as taught by Chou.

Wolf in view of Chou discloses a speech recognition method, but does not specifically teach determining vertices.

Wegmann discloses a method of determining vertices (column 8, line 36 - column 9, line 65), to construct a recognition hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wolf in view of Chou's method wherein it generates vertices, as taught by Wegmann, such that the recognition hypothesis corresponds to a path through the lattice (Column 8, lines 36-50).

Regarding **claims 3, 17, 39 and 53**, it is interpreted and rejected for the same reasons as set forth in claim 1. In addition Wolf discloses a method further comprising:

clustering together K-best initial phoneme paths for at least one consecutive frame (single best scoring path; column 3, paragraphs 0033-0040); and

selecting M-best refined phoneme paths among the clustered phoneme paths based on second scores of these paths (best scoring path; column 3, paragraphs 0033-0040).

Regarding **claims 4, 18 and 26**, Wolf discloses a method wherein the first score and the second score comprise a score based on phoneme acoustic models and language models (model; column 2, paragraph 0024 with column 4, paragraphs 0051-0055).

Regarding **claims 7 and 43**, Wolf discloses a method wherein determining the processing result comprises determining at least one of the following: at least one candidate textual representation of the input speech signal and a likelihood that the input speech signal contains targeted keywords (text transcript; column 1, paragraph 0006).

Regarding **claims 15 and 51**, it is interpreted and rejected for the same reasons as set forth in claim 1. In addition, Wolf discloses a method for distributing speech processing, comprising:

receiving an input speech signal by a client (spoken query; column 3, paragraphs 0033-0040);

constructing a phoneme lattice for the input speech signal by the client (lattice; column 3, paragraphs 0033-0040 with column 4, paragraph 0040);

transmitting the phoneme lattice from the client to a server (column 3, paragraphs 0033-0040 with column 4, paragraph 0040); and

searching the phoneme lattice to produce a result for the input speech signal for the purpose of at least one of recognizing speech and spotting keywords, in the input speech signal (speech recognition; column 3, paragraphs 0033-0040 with column 4, paragraph 0040).

Regarding **claims 24**, it is interpreted and rejected for the same reason as set forth in claim 15. In addition, Wolf discloses a speech processing system comprising:

a plurality of models for lattice construction (column 3, paragraphs 0033-0040 and column 4, paragraph 0055); and

a plurality of models for lattice search (column 3, paragraphs 0033-0040 and column 4, paragraph 0055).

Regarding **claim 27**, it is interpreted and rejected for the same reasons as set forth in the combination of claims 21 and 24.

Regarding **claim 37**, Wolf discloses an article, comprising a machine accessible medium having content stored thereon, wherein when the content is accessed by a processor, the content provides for processing a speech signal (executed in a computer; paragraph 0053):

receiving an input speech signal (spoken queries; column 1, paragraph 0013);

constructing a phoneme lattice for the input speech signal (lattice; column 2, paragraphs 0020-23 with column 4, paragraph 0055);

searching the phoneme lattice to produce a likelihood score for each potential path (likelihood of paths; column 3, paragraph 0038);

determining a processing result for the input speech signal based on the likelihood score of each potential path (likelihood scores of path; column 3, paragraphs 0033-0040);

segmenting an input speech signal into frames (word-level lattices; column 2, paragraph 0020 with column 3, paragraphs 0033-0040);

extracting acoustic features for a frame of the input speech signal (acoustic information; column 2, paragraphs 0022-0023 with column 1, paragraph 0013);

determining K-best initial phoneme paths leading to the frame based on a first score of each potential phoneme path leading to the frame (best scoring path; column 3, paragraphs 0033-0040); and

calculating a second score for each of the K-best phoneme paths for the frame (confidence scores; column 2, paragraph 0021 with column 3, paragraphs 0033-0040), but does not specifically teach determining vertices and arc parameters of the phoneme lattice for the input speech signal and calculating a second score for each of the K-best phoneme paths for the frame, the second score corresponding to a global score based on the first score and a third score combined for each of the K-best phoneme paths for the frame, wherein the third score is combined with a technique to incorporate word-level language probabilities at an end of a first phoneme of a word..

Chou discloses a speech recognition method (speech recognition) comprising calculating a second score for each of the K-best phoneme paths for the frame (best path), the second score corresponding to a global score (global score) based on the first score (score in the forward path) and a third score combined for each of the K-best phoneme paths for the frame (score of the backward path; column 11, lines 42-65), wherein the third score is combined with a technique to incorporate word-level (word level) language probabilities at an end of a first phoneme (phoneme) of a word (column 14, lines 1-19), reducing search complexity.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wolf's method wherein it is described above, for a high resolution decoding scheme when classifying acoustically confusable speech events (column 5, lines 56-59), as taught by Chou.

Wolf in view of Chou discloses a speech recognition method, but does not specifically teach determining vertices.

Wegmann discloses a method of determining vertices (column 8, line 36 - column 9, line 65), to construct a recognition hypothesis.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wolf in view of Chou's method wherein it generates vertices, as taught by Wegmann, such that the recognition hypothesis corresponds to a path through the lattice (Column 8, lines 36-50).

Regarding **claims 41-42**, it is interpreted and rejected for the same reason as set forth in claim 1.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAKIEDA R. JACKSON whose telephone number is (571)272-7619. The examiner can normally be reached on Monday-Friday from 5:30am-2:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626

JRJ
November 11, 2008